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EXAMINER	
RYMAN, DANIEL J	
ART UNIT	**PAPER NUMBER**
2665	16

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/273,197	GALLAGHER, ROBERT T.
	Examiner	Art Unit
	Daniel J. Ryman	2665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 March 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16 and 18-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16 and 18-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *15*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. Applicant's arguments filed 17 March 2003 have been fully considered but they are not persuasive. Applicant argues with respect to claims 1, 7, and 18 that it would not have been obvious to one of ordinary skill in the art to use DLC equipment in a system in which the copper wires have been replaced with coaxial cables in order to provide increased bandwidth for the end user. Examiner agrees that it would not have been obvious to continue to use the DLC equipment in a system in which coax cable has replaced copper wires since that "would ignore [Bernstein's] 'efficient multi-step process' of incorporating cable in a network (which replaces the DLC equipment)." Although Examiner does not expressly disclose that the DLC equipment is replaced by broadband capable equipment in order to substitute coaxial cable for the copper wire, Examiner contends that one of ordinary skill in the art would recognize that the DLC equipment needs to be replaced in light of the teaching of Bernstein, and, as such, that the DLC equipment cited in the Office Action is equivalent to broadband access equipment once the coax substitution for copper has taken place. Examiner has reworded claims 1, 7, and 18 in order to avoid future misinterpretations of the Examiner's position.

2. Applicant further argues, with respect to claim 1, that there is no teaching or suggestion in Bernstein that the broadband access equipment 203, 204 converts analog signals from the coax cable links to a serial digital signal for transmission and reception. Examiner, respectfully, disagrees. It is explicitly disclosed in Bernstein that a DLC, supporting copper cable, converts analog signals to serial digital signals for transport over the optical link (col. 6, lines 7-11) and that the DLC is switched with equipment that supports coax to offer greater bandwidth (col. 6,

lines 18-24). It is also explicitly disclosed that the coax cable continues to support the same narrowband signals (telephone) as did the copper cable (Fig. 2; Fig. 4; and col. 6, lines 7-30) in addition to supporting broadband services such as television. Thus it is obvious that the conversion of analog signals to serial digital signals for transport over the optical link that occurs in the copper system would also take place in the coax system since the coax system carries the same signals as the copper system in addition to other broadband signals. It is also obvious that since it is disclosed that this analog to digital conversion occurs on both ends of the fiber link (ref. 201, 202 and by extension ref. 203, 204) that the equipment on each end is capable of transmitting and receiving the digital signals.

3. With respect to claim 7, Applicant further argues that the teaching of Bernstein does not suggest that the broadband access equipment includes an A/D converter responsive to the bandpass filter or that the broadband access equipment includes a multiplexer, responsive to the A/D converter. For the reasons given above, with respect to claim 1, Examiner contends that Bernstein does teach having broadband access equipment 203, 204 which contains a multiplexer and an A/D converter. While not expressly disclosed that the multiplexer is responsive to the A/D converter, it is disclosed that multiplexing and A/D conversion occur. Having the multiplexer be responsive to the A/D converter is well known in the art and thus would have been obvious to one of ordinary skill in the art. Applicant further makes a broad argument that none of the references teach a bandpass filter and proceeds to argue that Bernstein does not disclose the bandpass filter. Examiner agrees that Bernstein does not disclose the bandpass filter, which is why Examiner combines Bernstein with Bodeep and Chambers. Since Applicant does

not offer any specific arguments as to why the combination of the cited references does not disclose the bandpass filter, Examiner is not convinced that the rejection was improper.

4. With respect to claim 13, Examiner contends that the amended claim reads on Bernstein in view of arguments made with respect to claim 1.

5. With respect to claim 18, Applicant makes a broad argument that none of the references teach a filter that is operable to compensate for quantization effects and proceeds to argue that Bernstein does not disclose the filter operable to compensate for quantization effects. Examiner agrees that Bernstein does not disclose the filter operable to compensate for quantization effects, which is why Examiner combines Bernstein with Tsutsui. Since Applicant does not offer any specific arguments as to why the combination of the cited references does not disclose the filter operable to compensate for quantization effects, Examiner is not convinced that the rejection was improper.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076).

8. Regarding claim 1, Bernstein discloses a hybrid fiber/copper wire network, comprising: a head end (ref. 300-3); at least one optical distribution node coupled to the head end over at least one fiber optic link (ref. 21); a plurality of coaxial cable links coupled to each of the at least one

optical distribution node (ref. 34); a transmitter, disposed at the optical distribution node, that is responsive to signals from the plurality of coaxial cable links, that converts analog signals to digital signals and that transmits the digital signals to the head end over the at least one optical link (ref. 203, 204; col. 6, lines 7-11; and col. 6, lines 25-30) where it is explicitly disclosed that a DLC, supporting copper cable, converts analog signals to serial digital signals for transport over the optical link and that the DLC is switched with equipment that supports coax to offer greater bandwidth. Since the coax cable continues to carry the same analog signals (telephone) that the copper cable carrier in addition to higher bandwidth signals, it would have been obvious to one of ordinary skill in the art to continue the data format conversion from analog signals in the cable to serial digital in the fiber at the optical distribution node. Similarly, Bernstein further discloses a receiver, disposed at the head end, that is responsive to the digital signals from the transmitter and that converts the digital signals to analog signals for the head end (ref. 203, 204; col. 6, lines 7-11; and col. 6, lines 25-30). Bernstein possibly does not disclose that the digital signals are baseband digital signals. However, the use of baseband signals is well-known in the art with one well-known benefit being that the transmission of baseband signals does not require the use of extra equipment to modulate and demodulate the signal, as is evidenced by Krajewski (col. 1, lines 15-25), thus reducing costs. It would have been obvious to one of ordinary skill in the art to transmit the digital signals as baseband signals in order to avoid the extra costs incurred by using equipment to modulate and demodulate the signal with respect to frequency.

9. Regarding claim 2, referring to claim 1, Bernstein disclose that the transmitter includes an analog to digital converter (col. 6, lines 7-11). Bernstein possibly does not disclose that the transmitter is operable to generate at least 850 Mbps; however, it is generally considered to be

within the ordinary skill in the art to adjust, vary, select, or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on applicant. In re Mason, 87 F.2d 370, 32 USPQ 242 (CCPA 1937); Marconi Wireless Telegraph Co. v. U.S., 320 U.S. 1, 57 USPQ 471 (1943); In re Schneider, 148 F.2d 108, 65 USPQ 129 (CCPA 1945); In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1055); In re Saether, 492 F.2d 849, 181 USPQ 36 (CCPA 1974); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Since it is obvious that Bernstein's transmitter is operable to generate a signal, which is output at a speed, it would have been obvious to one of ordinary skill in the art to have a transmitter generate a signal at any speed.

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076) as applied to claim 1 above, and further in view of Radice (USPN 5,138,440).

11. Regarding claim 3, referring to claim 1, Bernstein in view of Krajewski possibly does not disclose separately converting signals from the plurality of coaxial cables into separate, n-bit signals, and combining the separate n-bit signals into a serial data stream, although Bernstein does teach multiplexing multiple signals into a single digital serial stream for transmission (col. 6, lines 7-11). Radice teaches a method of multiplexing multiple signals into one stream for transmission by separately converting signals from the plurality of cables into separate, n-bit signals, and combining them into a serial data stream (Fig. 1 and col. 3, lines 18-30 and lines 5-10). Radice does this to allow the system to receive and transmit multiple asynchronous signals (col. 1, lines 44-47 and lines 54-64). It would have been obvious to one of ordinary skill in the

art at the time of the invention to multiplex the multiple signals into one data stream by separately converting the signals and then combining them in order to allow for asynchronous reception and transmission of multiple asynchronous signals.

12. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076) as applied to claim 1 above, and further in view of Hoffart (USPN 5,341,216) and Radice (USPN 5,138,440).

13. Regarding claim 4, referring to claim 1, Bernstein in view of Krajewski possibly does not disclose having the transmitter incorporate data from a status monitor in the baseband signal transmitted to the head end. Hoffart teaches the use of a status monitor which can transmit its status data (Fig. 2, ref. 8 and col. 6, lines 24-40). The purpose of this monitor is to provide status data to a central head end monitor (Fig. 2, ref. 8 and col. 3, lines 6-10). Radice teaches including auxiliary data in the data stream by multiplexing (incorporating) the auxiliary data with the data stream (Fig. 1 and col. 3 lines 24-30). It would have been obvious to one of ordinary skill in the art at the time of the invention to have the transmitter incorporate data from a status monitor in the baseband signal transmitted to the head end in order to inform the head end of the information collected by the status monitor.

14. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076) as applied to claim 1 above, and further in view of Sayeed et al (USPN 5,828,677) and Radice (USPN 5,138,440).

15. Regarding claim 5, referring to claim 1, Bernstein in view of Krajewski possibly does not disclose having the transmitter incorporate bit error rate link performance data in the baseband signal transmitted to the head end. Sayeed teaches sending line information such as BER back to

a transmitter in order to allow the transmitter to use that information to adjust transmission characteristics (col. 2, lines 35-46). Radice teaches including auxiliary data in the data stream by multiplexing (incorporating) the auxiliary data with the data stream (Fig. 1 and col. 3, lines 24-30). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate bit error rate link performance data into the baseband digital signal transmitted to the head end in order to permit the head end to use the data in a manner which ensures low BER on the line by adjusting the transmission properties at the head end.

16. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076) as applied to claim 1 above, and further in view of Johnson et al (USPN 3,995,144) and Petroff (USPN 5,198,989).

17. Regarding claim 6, referring to claim 1, Bernstein in view of Krajewski possibly does not disclose having a transmitter which combines the signals from the plurality of coaxial cables prior to converting the signals to baseband digital signals. Johnson discloses such a system design for converting and combining analog inputs into a serial digital stream (col. 6, line 68 to col. 7, line 11) as does Petroff (Fig 2, ref. 102 and 106 and col. 6, lines 19-29). It is obvious that such an arrangement only necessitates a single analog-to-digital converter instead of one converter for each input, thus decreasing the cost for implementing the system. It would have been obvious to one skilled in the art at the time of the invention use a multiplexer to combine signals before performing analog to digital conversion in order to implement the system with a single analog-to-digital converter instead of one converter for each input.

18. Claim 7, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076) in further view of

Bodeep et al (USPN 5,864,672) in further view of Chambers et al (USPN 5,867,485) in further view of Radice (USPN 5,138,440).

19. Regarding claim 7, Bernstein discloses a transmitter, for an optical distribution node (ref. 320), the transmitter comprising: at least one analog to digital converter that creates bandpass digital data from the return path signals (col. 6, lines 7-11 and col. 6, lines 25-30); at least one multiplexer that creates a serial digital data stream (col. 6, lines 7-11 and col. 6, lines 25-30); and an optical transmitter, responsive to the at least one multiplexer, that is operable to transmit the serial data stream to a head end as a digital signal (col. 6, lines 7-11 and col. 6, lines 25-30) where it is explicitly disclosed that a DLC, supporting copper cable, converts analog signals to serial digital signals for transport over the optical link and that the DLC is switched with equipment that supports coax to offer greater bandwidth. Since the coax cable continues to carry the same analog signals (telephone) that the copper cable carrier in addition to higher bandwidth signals, it would have been obvious to one of ordinary skill in the art to continue the data format conversion from analog signals in the cable to serial digital in the fiber at the optical distribution node. Bernstein possibly does not disclose that the digital signals are baseband digital signals. However, the use of baseband signals is well-known in the art with one well-known benefit being that the transmission of baseband signals does not require the use of extra equipment to modulate and demodulate the signal, as is evidenced by Krajewski (col. 1, lines 15-25), thus reducing costs. It would have been obvious to one of ordinary skill in the art to transmit the digital signals as baseband signals in order to avoid the extra costs incurred by using equipment to modulate and demodulate the signal with respect to frequency. Bernstein in view of Krajewski possibly does not disclose at least one bandpass filter that is operable to select a portion of the

frequency spectrum that is associated with return path signals for a hybrid fiber/coax network; however, Bernstein in view of Krajewski does disclose that the analog signals arrive in the range of frequencies of 300-3000 Hz (Bernstein: col. 6, lines 7-11) and it is well known in the art that broadband supports an even larger frequency range. Bodeep discloses that it is known in HFC systems to define an upstream frequency band of 5-40 MHz (col. 1, lines 58-60) where it is obvious that the upstream band is provided for nodes to communicate with the head end. Chambers teaches it is known to use bandpass filters to filter out everything except the desired band of signals (col. 8, lines 30-32). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use a bandpass filter to obtain the desired upstream portion of the frequency spectrum. Bernstein in view of Krajewski in further view of Bodeep in further view of Chambers possibly does not disclose that the ADC is responsive to the bandpass filter and the multiplexer is responsive to the ADC. Radice teaches a method of multiplexing multiple signals into one stream for transmission by separately converting signals from the plurality of cables into separate, n-bit signals, and combining them into a serial data stream (Fig. 1 and col. 3, lines 18-30 and lines 5-10) where from Bernstein in view of Krajewski in further view of Bodeep in further view of Chambers it is obvious to use a bandpass filter to first select the desired signal on a transmission line. Radice does this to allow the system to receive and transmit multiple asynchronous signals (col. 1, lines 44-47 and lines 54-64). It would have been obvious to one of ordinary skill in the art at the time of the invention to have the ADC be responsive to the bandpass filter and the multiplexer be responsive to the ADC in order to allow for asynchronous reception and transmission of multiple asynchronous signals.

20. Regarding claim 9, referring to claim 7, Bernstein in view of Krajewski in further view of Bodeep in further view of Chambers in further in view of Radice disclose that the bandpass filter includes a pass band from 5 to 42 MHz. Although this pass band is not 5 to 42 MHz, it is generally considered to be within the ordinary skill in the art to adjust, vary, select, or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on applicant. In re Mason, 87 F.2d 370, 32 USPQ 242 (CCPA 1937); Marconi Wireless Telegraph Co. v. U.S., 320 U.S. 1, 57 USPQ 471 (1943); In re Schneider, 148 F.2d 108, 65 USPQ 129 (CCPA 1945); In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1055); In re Saether, 492 F.2d 849, 181 USPQ 36 (CCPA 1974); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

21. Regarding claim 10, referring to claim 7, Bernstein in view of Krajewski in further view of Bodeep in further view of Chambers in further in view of Radice disclose that the at least one analog to digital converter includes one analog to digital converter for each coaxial link associated with the transmitter (Radice: Fig. 1 and col. 3, lines 18-30 and lines 5-10).

22. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076) in further view of Bodeep et al (USPN 5,864,672) in further view of Chambers et al (USPN 5,867,485) in further view of Radice (USPN 5,138,440) as applied to claim 7 above, and further in view of Smith, III (USPN 4,112,488).

23. Regarding claim 8, referring to claim 7, Bernstein in view of Krajewski in further view of Bodeep in further view of Chambers in further in view of Radice disclose including auxiliary

data in the data stream by multiplexing (incorporating) the auxiliary data with the data stream (Radice: Fig. 1 and col. 3, lines 24-30). Bernstein in view of Krajewski in further view of Bodeep in further view of Chambers in further in view of Radice possible does not disclose having the transmitter include a monitor which monitors the operation of the optical distribution node and that creates status data for transmission to a head end in the serial data stream. Smith teaches having a node monitor which reports data to a central control so that the central control can "take action to control the use of links associated with the node" if there are any problems with the node (col. 10, lines 56-60). It would have been obvious to one of ordinary skill in the art at the time of the invention to have the transmitter incorporate data from a status monitor in the baseband signal transmitted to the head end in order to inform the head end of the information collected by the status monitor.

24. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076) in further view of Bodeep et al (USPN 5,864,672) in further view of Chambers et al (USPN 5,867,485) in further view of Radice (USPN 5,138,440) as applied to claim 7 above, and further in view of Ferris (USPN 3,931,473).

25. Regarding claim 11, referring to claim 7, Bernstein in view of Krajewski in further view of Bodeep in further view of Chambers in further in view of Radice possibly does not disclose having a two stage multiplexer in which the first stage multiplexes each coaxial link and the second stage multiplexes the output of the first stage. Ferris teaches that it is known in prior art to use a multi-stage multiplexer in which the first stage multiplexes signals and a second stage multiplexes the output of the first stage (Fig. 1). Ferris also states that such a set-up "because of

its second level nature inherently carries a large amount of information" (col. 1, lines 25-26). It would have been obvious to one of ordinary skill in the art of optical node transmitters use a second-level multiplexer in order to have the optical node be able to carry large amounts of information.

26. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076) in further view of Bodeep et al (USPN 5,864,672) in further view of Chambers et al (USPN 5,867,485) in further view of Radice (USPN 5,138,440) as applied to claim 7 above, and further in view of Sayeed et al (USPN 5,828,677).

27. Regarding claim 12, referring to claim 7, Bernstein in view of Krajewski in further view of Bodeep in further view of Chambers in further in view of Radice possibly does not disclose having the transmitter incorporate bit error rate link performance data in the baseband signal transmitted to the head end; however Radice teaches including auxiliary data in the data stream by multiplexing (incorporating) the auxiliary data with the data stream (Fig. 1 and col. 3, lines 24-30). Sayeed teaches sending line information such as BER back to a transmitter in order to allow the transmitter to use that information to adjust transmission characteristics (col. 2, lines 35-46). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate bit error rate link performance data into the baseband digital signal transmitted to the head end in order to permit the head end to use the data in a manner which ensures low BER on the line by adjusting the transmission properties at the head end.

28. Claim 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076) in view of Bodeep et al (USPN 5,631,757).

29. Regarding claim 13, Bernstein discloses receiving analog, upstream data at an optical distribution node from at least one coaxial cable link (col. 6, lines 7-11 and col. 6, lines 25-30); generating digital data from the analog, upstream data (col. 6, lines 7-11 and col. 6, lines 25-30); creating a serial data stream including the digital data (col. 6, lines 7-11 and col. 6, lines 25-30); and transmitting the digital data to a head end of the network (col. 6, lines 7-11 and col. 6, lines 25-30) where it is explicitly disclosed that a DLC, supporting copper cable, converts analog signals to serial digital signals for transport over the optical link and that the DLC is switched with equipment that supports coax to offer greater bandwidth. Since the coax cable continues to carry the same analog signals (telephone) that the copper cable carrier in addition to higher bandwidth signals, it would have been obvious to one of ordinary skill in the art to continue the data format conversion from analog signals in the cable to serial digital in the fiber at the optical distribution node. Bernstein possibly does not disclose that the digital signals are baseband digital signals. However, the use of baseband signals is well-known in the art with one well-known benefit being that the transmission of baseband signals does not require the use of extra equipment to modulate and demodulate the signal, as is evidenced by Krajewski (col. 1, lines 15-25), thus reducing costs. It would have been obvious to one of ordinary skill in the art to transmit the digital signals as baseband signals in order to avoid the extra costs incurred by using equipment to modulate and demodulate the signal with respect to frequency. Bernstein in view of Kajewski possibly does not disclose that the digital information is transmitted using a laser.

Bodeep discloses using a laser as a transmitter because some lasers are inexpensive (col. 5, lines 11-21). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a laser as the transmitter because some lasers are inexpensive.

30. Regarding claim 14, referring to claim 13, Bernstein disclose that the transmitter includes an analog to digital converter (col. 6, lines 7-11). Bernstein possibly does not disclose that the transmitter is operable to generate at least 850 Mbps; however, it is generally considered to be within the ordinary skill in the art to adjust, vary, select, or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on applicant. In re Mason, 87 F.2d 370, 32 USPQ 242 (CCPA 1937); Marconi Wireless Telegraph Co. v. U.S., 320 U.S. 1, 57 USPQ 471 (1943); In re Schneider, 148 F.2d 108, 65 USPQ 129 (CCPA 1945); In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1055); In re Saether, 492 F.2d 849, 181 USPQ 36 (CCPA 1974); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Since it is obvious that Bernstein's transmitter is operable to generate a signal, which is output at a speed, it would have been obvious to one of ordinary skill in the art to have a transmitter generate a signal at any speed.

31. Regarding claims 15 and 16, referring to claim 13, Bernstein discloses that creating the digital data stream comprises multiplexing at least one of n-bit digital data streams into a serial data stream (col. 6, lines 7-11).

32. Claims 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076) in further view of Radice (USPN 5,138,440) in further view of Tsutsui (USPN 5,680,130).

33. Regarding claim 18, Bernstein discloses an optical receiver (ref. 203) that is operable to receive a serial, digital signal from an optical link (ref. 21) (col. 6, lines 7-11 and col. 6, lines 25-30); and at least one digital to analog converter, responsive to the at least one demultiplexer, that creates analog signals for the head end (col. 6, lines 7-11; and col. 6, lines 25-30), where it is explicitly disclosed that a DLC, supporting copper cable, converts analog signals to serial digital signals for transport over the optical link and that the DLC is switched with equipment that supports coax to offer greater bandwidth. Since the coax cable continues to carry the same analog signals (telephone) that the copper cable carrier in addition to higher bandwidth signals, it would have been obvious to one of ordinary skill in the art to continue the data format conversion from analog signals in the cable to serial digital in the fiber at the optical distribution node. Bernstein possibly does not disclose that the digital signals are baseband digital signals. However, the use of baseband signals is well-known in the art with one well-known benefit being that the transmission of baseband signals does not require the use of extra equipment to modulate and demodulate the signal, as is evidenced by Krajewski (col. 1, lines 15-25), thus reducing costs. It would have been obvious to one of ordinary skill in the art to transmit the digital signals as baseband signals in order to avoid the extra costs incurred by using equipment to modulate and demodulate the signal with respect to frequency. Bernstein in view of Krajewski possibly does not expressly disclose having at least one demultiplexer, responsive to the optical receiver, that demultiplexes the digital baseband signal. Radice discloses having a demultiplexer at a receiver in order to break the multiplexed signal into its constituents so that each signal can be acted upon individually (col. 2, lines 63-68). It would have been obvious to one of ordinary skill in the art at the time of the invention to have at least one demultiplexer, responsive to the

optical receiver, that demultiplexes the digital baseband signal in order to process each of the constituent signals individually. Bernstein in view of Krajewski in further view of Radice possibly does not disclose having at least one filter that is operable to compensate for quantization effects in the frequency spectrum that is associated with return path signals for a HFC network. Tsutsui teaches the use of a filter to compensate for quantization effects (col. 1, lines 60-62). It would have been obvious to one of ordinary skill in the art of receivers to include a filter to get rid of unwanted quantization noise in the incoming signal.

34. Regarding claim 20, referring to claim 18, Bernstein in view of Krajewski in further view of Radice in further view of Tsutsui discloses using one analog to digital converter for each coaxial link associated with the receiver as a way to convert a digital signal to an analog signal after reception over an optical link (Radice: Fig. 1 and 3 and col. 4, line 62 to col. 5, line 5). It would have been obvious to one of ordinary skill in the art of receivers to implement the digital to analog conversion of the receiver by having digital to analog conversion on each of the receiver's coax cables.

35. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076) in further view of Radice (USPN 5,138,440) in further view of Tsutsui (USPN 5,680,130) as applied to claim 18 above, and further in view of Hoffart (USPN 5,341,216).

36. Regarding claim 19, referring to claim 18, Bernstein in view of Krajewski in further view of Radice in further view of Tsutsui possibly does not disclose having the receiver have the demultiplexer remove status data fro the head end from the serial baseband signal; however, Radice teaches including auxiliary data in the data stream by multiplexing (Fig. 1 and col. 3,

lines 24-30). Radice also teaches taking that auxiliary data back out of the data stream at the receive end through demultiplexing (Fig. 1). Hoffart teaches the use of a status monitor which can transmit its status data (col. 2, lines 6-10 and col. 6, lines 18-24 and 36-40). The purpose of this monitor is to provide status data to a central head end monitor (col. 3, lines 6-10). It would have been obvious to one of ordinary skill in the art at the time of the invention to demultiplex any status data arriving from a status monitor to a central head end monitoring unit in order for the data to be processed.

37. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076) in further view of Radice (USPN 5,138,440) in further view of Tsutsui (USPN 5,680,130) as applied to claim 18 above, and further in view of Ferris (USPN 3,931,473) and Brouard et al. (USPN 4,244,046).

38. Regarding claim 21, referring to claim 18, Bernstein in view of Krajewski in further view of Radice in further view of Tsutsui possibly does not disclose having a two stage demultiplexer in which the first stage multiplexes the received data stream and the second stage demultiplexes the output of the first stage. Ferris teaches that it is known in prior art to use a multi-stage multiplexer in which the first stage multiplexes signals and a second stage multiplexes the output of the first stage (Fig. 1). Ferris also states that such a set-up "because of its second level nature inherently carries a large amount of information" (col. 1 lines 25-26). It would have been obvious to one of ordinary skill in the art of optical node transmitters use a second-level multiplexer in order to have the optical node be able to carry large amounts of information. Brouard teaches the use of a multi-stage demultiplexer in order to reverse the process of a multi-stage multiplexer (Fig. 1). It would have been obvious to one of ordinary skill in the art of

receivers to implement a two-stage demultiplexer in order to undo the process of a second-level multiplexer implemented in order to have the received signal be able to carry large amounts of information.

39. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al (USPN 5,729,370) in view of Krajewski (USPN 4,402,076) in further view of Radice (USPN 5,138,440) in further view of Tsutsui (USPN 5,680,130) as applied to claim 18 above, and further in view of Sayeed et al (USPN 5,828,677).

40. Regarding claim 22, referring to claim 18, Bernstein in view of Krajewski in further view of Radice in further view of Tsutsui teaches including auxiliary data in the data stream by multiplexing (Radice: Fig. 1 and col. 3, lines 24-30) and taking that auxiliary data back out of the data stream at the receive end through demultiplexing (Radice: Fig. 1). Sayeed teaches sending line information such as BER back to a transmitter in order to allow the transmitter to use that information to adjust transmission characteristics (col. 2, lines 35-46). It would have been obvious to one of ordinary skill in the art at the time of the invention to demultiplex the BER data which was incorporate into the baseband digital signal in order to permit the head end to use the data in a manner which ensures low BER on the line by adjusting the transmission properties at the head end so that the head end can access that BER data.

Conclusion

41. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Ryman whose telephone number is (703)305-6970. The examiner can normally be reached on Mon.-Fri. 7:00-5:00 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (703)308-6602. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-6743 for regular communications and (703)308-9051 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

Daniel J. Ryman
Examiner
Art Unit 2665

DJR

Daniel J. Ryman
May 2, 2003

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